

REMARKS

Claims 1, 3 – 6, 8 – 10 and 12 – 16 are now pending in the application. Minor amendments have been made to the claims to simply overcome the objections to the specification and rejections of the claims under 35 U.S.C. § 112. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 112

Claims 12, 13 and 16 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. This rejection is respectfully traversed.

Claims 12, 13 and 16 have each been amended per the Examiner's suggestions. More specifically, claim 12 has been amended to recite "activating said at least one cylinder", claim 13 has been amended to recite "detecting termination of said braking condition" and claim 16 has been amended to recite "providing electrical current to said electric machine". Therefore, reconsideration and withdrawal of the rejections are respectfully requested.

REJECTION UNDER 35 U.S.C. § 102

Claims 1 – 7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Tamai et al. (U.S. Pat. No. 6,307,277). This rejection is respectfully traversed.

At the outset, Applicant notes that claims 2 and 7 have been cancelled without prejudice or disclaimer of the subject-matter contained therein. Therefore, the rejections of claims 2 and 7 have been rendered moot.

Claim 1, as amended herein, include deactivating at least one cylinder of an engine in response to a braking condition while maintaining at least another cylinder of the engine active. Tamai fails to teach or suggest deactivating at least one cylinder of an engine in response to a braking condition while maintaining at least another cylinder of the engine active.

The present invention provides a regenerative braking system with a displacement on demand (DOD) engine in an electric hybrid vehicle. The regenerative braking system generates current to recharge a battery while at least one engine cylinder remains active to provide sufficient drive torque if suddenly required. For example, while the engine is powering the vehicle and braking is initiated by an operator, at least one cylinder is deactivated to reduce engine braking. The regenerative braking system absorbs an increased amount of the vehicle's kinetic energy while at least one cylinder remains active.

Tamai discloses a fuel management control system for a traditional hybrid vehicle that implements a traditional engine and regenerative braking system (Abstract). Upon deceleration, the fuel management controls fuel on-off transitions of the engine (Col. 2, Lines 38 – 40). Initially, sparking is ramped and fuel to the cylinders is cut on a cylinder by cylinder basis to balance smoothness and emissions. Once fuel and spark are cut to all of the cylinders, the engine is kept spinning by a reverse-flywheel torque

converter and transmission downshifts are performed with the aid of an electric machine, until the transmission is dropped to neutral. (see Col. 2, Lines 39 – 49).

Because the system of Tamai cuts fuel and spark (i.e., deactivates) to all of the cylinders, Tamai fails to teach or suggest deactivating at least one cylinder of an engine in response to a braking condition while maintaining at least another cylinder of the engine active. Therefore, reconsideration and withdrawal of the rejections are respectfully requested.

Each of claims 3 – 6 depend from claim 1, which defines over the prior art, as discussed in detail above. Therefore, claims 3 – 6 also define over the prior art, for at least the reasons discussed with respect to claim 1, and reconsideration and withdrawal of the rejections are respectfully requested.

REJECTION UNDER 35 U.S.C. §102 OR § 103

Claims 8 – 16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Tamai et al. (U.S. Pat. No. 6,307,277) or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Tamai et al. (U.S. Pat. No. 6,307,277. This rejection is respectfully traversed.

At the outset, Applicant notes that claim 11 has been cancelled without prejudice or disclaimer of the subject-matter contained therein. Therefore, the rejection of claim 11 has been rendered moot.

Each of claims 8 and 13, as amended herein, include deactivating at least one cylinder of an engine in response to a braking condition while maintaining at least another cylinder of the engine active. Tamai fails to teach or suggest deactivating at

least one cylinder of an engine in response to a braking condition while maintaining at least another cylinder of the engine active.

As discussed in detail above, the fuel management control system disclosed in Tamai cuts fuel and spark (i.e., deactivates) to all of the cylinders. Therefore, Tamai fails to teach or suggest deactivating at least one cylinder of an engine in response to a braking condition while maintaining at least another cylinder of the engine active, and reconsideration and withdrawal of the rejections are respectfully requested.

Each of claims 9, 10, 12 and 14 – 16 each depend from one of claims 8 and 13, which define over the prior art, as discussed in detail above. Therefore, claims 9, 10, 12 and 14 – 16 also define over the prior art, for at least the reasons discussed with respect to claims 8 and 13, and reconsideration and withdrawal of the rejections are respectfully requested.

OTHER CLAIM AMENDMENTS

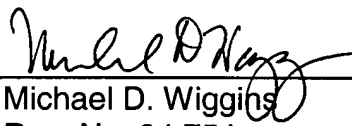
Claims 3, 9 and 15 have been amended to conform with the amended claims 1, 8 and 13, respectively. More specifically, claim 3 has been amended to include that the controller detects termination of the braking condition and activates all of the cylinders in response to the termination. Claims 9 and 15 have each been amended to delete the step of deactivating all of the cylinders of the engine.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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